



**U.S. Department of Energy
Technical Qualification Program**

Occupational Safety Qualification Standard

Study Guide

Glossary

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Appendix A Glossary

Appendix A Glossary

Abrasion	Rubbed-away or scraped off the surface covering the body (e.g., of skin or mucous membrane).
Accident	Unplanned, and sometimes injurious or damaging, event that interrupts the normal progress of an activity and is invariably preceded by an unsafe act or unsafe condition, or some combination thereof.
Acid	Chemical compound that dissociates hydrogen ions when dissolved in water. The resulting acid solutions taste sour, turn litmus paper or solution red, and neutralize bases.
Acute	Severe, often dangerous exposure in which relatively rapid changes are occurring. An acute exposure normally runs a comparatively short course.
Action Level	Term used by OSHA and the National Institute for Occupational Safety and Health to express the level of toxicant that requires medical surveillance, usually one-half the permissible exposure level.
Administrative Controls	Methods of controlling employee exposures by job rotation, work assignment, or time periods away from the hazard.
Air Monitoring	Sampling for and measuring of pollutants in the atmosphere.
Air-Purifying Respirator	Respirator that uses filters or sorbents to remove harmful substances from the air.
Air-Supplied Respirator	Respirator that provides a supply of breathable air from a clean source outside the contaminated work area.
American National Standards Institute (ANSI)	Voluntary membership organization that develops national consensus standards for a large number of devices and procedures.
Asbestosis	Chronic lung disease with signs and symptoms resulting from



Appendix A Glossary

permanent changes in the lung tissue due to inhalation of fine airborne fibers of asbestos.

Atom

Smallest particle of an element. As a chemical unit, it remains unchanged during any chemical reaction, yet may undergo nuclear changes to other atoms, as in atomic fission.

Base

A compound that reacts with an acid to form a salt. It is another term for alkali. It turns litmus paper blue.

Audible Range

Frequency range over which normal ears hear: approximately 20 hertz (Hz) through 20,000 Hz.

Bioassay

Measurement of the activity of a drug from its effects on living organisms.

Bloodborne Pathogen

Pathogenic microorganisms that are present in human blood and cause disease in humans. These include, but are not limited to, hepatitis B (HBV) and human immunodeficiency virus (HIV).

Boiling Point

Temperature at which a liquid starts to boil; that is, when the vapor pressure of the liquid is equal to the atmospheric pressure exerted on the liquid.

Breathing Zone Sample

Air sample collected in the breathing zone of the workers to assess their exposure to airborne contaminants.

Candle

Unit of luminous intensity. Candlepower is a measure of intensity of a source of light compared with a standard candle.

Carcinogen

Any substance that, under certain quantified exposures, produces cancer in animals or humans.

Carpal Tunnel Syndrome

Common affliction caused by compression of the median nerve in the carpal tunnel. Often associated with tingling, pain, or numbness in the thumb and first three fingers; may be job-related.

CAS Number

Used to identify a particular chemical by the Chemical Abstract Service (CAS), a service of the American Chemical Society, which indexes and compiles abstracts of worldwide chemical literature



Appendix A Glossary

called *Chemical Abstracts*.



Appendix A Glossary

Ceiling Limit (C)	Airborne concentration of a toxic substance in the work environment, which should never be exceeded.
Celsius	Temperature scale in which 100° is the boiling point and 0° is the freezing point of water.
CFR (<i>Code of Federal Regulations</i>)	Includes the rules that are promulgated under U.S. law, published in the <i>Federal Register</i> , and actually in force at the end of a calendar year.
Chronic	Persistent, prolonged, repeated.
Confined Space	Enclosed space with limited or restricted means of entry or exit, which is not meant for continuous occupancy. These may include underground vaults, tanks, storage bins, pits and diked areas, vessels, and silos.
Controls	In general, measures including devices to regulate a machine, apparatus, system, or action within prescribed limits or standards of safety and operational effectiveness.
Danger	Generally, the liability or potential for producing harm.
Decibel (dB)	Logarithmic unit used to express sound power level. Sound power is the total acoustic output of a sound source in watts.
Deflagration	Exothermic (heat, burning) reaction that expands rapidly from the burning gases to the unreacted material by conduction, convection, and radiation.
Density	Ratio of the mass to volume.
Detonation	A violent chemical reaction within a chemical compound or mechanical mixture evolving heat and pressure. A detonation is a reaction that proceeds through the reacted material toward the unreacted material at a supersonic velocity.
Diffusion Rate	Tendency of one gas or vapor to disperse into or mix with another gas or vapor. This rate depends on the density of the vapor or gas as compared with that of air, which is given a value of 1.



Appendix A Glossary

Disease	Any deviation of the body from its normal or healthy state, or a particular disorder with one or more specific causes and characteristic symptoms.
Dust	Suspended particles of solid matter in such a fine state of division that they may be inhaled, ingested, or absorbed. <i>Dust</i> is a descriptive term for airborne solid particles that range in size from 0.1 to 25 microns.
Element	Solid, liquid, or gaseous matter that cannot be further decomposed into simpler substances by chemical means.
Endothermic	Characterized by or formed with absorption of heat.
Energy	Capacity for doing work. Various forms of energy include chemical, electrical, geothermal, kinetic, nuclear, potential, solar, wind, and others.
Epidemiology	Study of disease as it spreads and involves large groups of people.
Ergonomics	Multidisciplinary activity dealing with the interactions between man and his total working environment plus stresses related to such environmental elements as atmosphere, heat, light, and sound, as well as all tools and equipment in the workplace.
Exhaust Ventilation	Removal of air, usually by mechanical means, from any space. The flow of air between two points is due to the occurrence of a pressure difference between two points, causing the air to flow from the high-pressure to the low-pressure zone.
Explosion	Rapid increase of pressure in a confined space followed by its sudden release due to rupture of the container. The increase in pressure is generally caused by an exothermic chemical reaction of an overpressurization of a system.
Exposure	Contact with a chemical, biological, or physical hazard.
Eye Protection	Device that safeguards the eye in an eye-hazard environment. See Practice for Occupational and Educational Eye and Face Protection-ANSI Z87.1.



Appendix A Glossary

Face Velocity	Average air velocity into the exhaust system measured at the opening into the hood or booth.
Fire	Rapid oxidation of material or substance with the evolution of heat and light.
Fire Extinguisher	<p>Device having characteristics essential for extinguishing flame; may contain liquid, dry chemicals, or gases. They are tested and rated to indicate their ability to handle specific classes and sizes of fires, as follows:</p> <ul style="list-style-type: none">• Class A: For ordinary combustibles, such as wood, paper, and textiles• Class B: For flammable liquid and gas fires, such as oil, gasoline, paint, and grease, where oxygen exclusion or flame interruption is essential• Class C: For fires involving energized electrical wiring and equipment, where the nonconductivity of the extinguishing agent is important• Class D: For fires in combustible metals such as magnesium, potassium, powdered aluminum, zinc, sodium, and lithium
Flammable Range	Difference between the lower and upper flammable limits, expressed in terms of percentage of vapor or gas in air by volume.
Frequency	For electrical machinery or electronics: Cycles per second or hertz relating to alternating current. For noise: The number of vibrations per unit of time, usually expressed in cycles per second or hertz.
Fume	Airborne particulate formed by the emission of solid materials, e.g., metal fume emitted during welding.
Gas	State of matter in which the material has a low density and viscosity; can expand and contract in response to changes in temperature and pressure.
Gas Mask	Face covering connected to its own purifying device, which filters harmful gases from the air so that uncontaminated air may be breathed. Refer to Practice for Respiratory Protection-ANSI Z88.2.



Appendix A Glossary

General Ventilation	System of ventilation consisting of either natural or mechanically induced fresh air movements to mix with and dilute contaminants in the workroom air. This is not the recommended type of ventilation to control toxic contaminants.
Glove Box	Sealed enclosure in which all handling of items inside the box is carried out through long impervious gloves sealed to ports in the walls of the enclosure.
Grab Sample	Sample that is taken in a very short time period to determine the constituents at a specific time.
Gram	Metric unit of mass (453.6 grams equal 1 pound).
Ground	Conductor that provides an electrical path for the flow of current into the earth.
Half-Life	In radioactive terms, the time required for a radioactive substance to lose one-half of its activity (strength or intensity) by decay.
Hazard	Condition or changing set of circumstances that presents a potential for injury, illness, or property damage.
Hearing Conservation	Prevention or minimization of noise-induced deafness through the use of hearing protection devices, the control of noise through engineering methods, annual audiometric tests, and employee training.
Heat Cramps	Painful muscle spasms as a result of exposure to excess heat.
Heat Exhaustion	Condition usually caused by loss of body water due to exposure to excess heat. Symptoms include headaches, tiredness, nausea, and sometimes fainting.
Heat Stroke	Condition resulting from excessive exposure to intense heat, characterized by high fever, collapse, and sometimes convulsions or coma.
HEPA (High-Efficiency Particulate Air) Filter	An extended medium, dry-type filter with a particle removal efficiency of no less than 99.97 percent of 0.3 micron particles.



Appendix A Glossary

Hepatitis	Inflammation of the liver resulting from a virus or toxic origin.
Hood	(1) Enclosure, part of a local exhaust ventilation system; (2) a device that completely covers the head, neck, and portions of the shoulders.
IDLH	Immediately dangerous to life or health.
Illumination	Amount of light flux a surface receives per unit area. May be expressed in lumens per square foot or in footcandles.
Immune	Resistant to disease.
Inches of Mercury	Unit used in measuring pressure that is equal to the pressure exerted by a column of mercury 1 inch high at a standard temperature.
Incidence Rate	Injury/illness rate based upon 200,000 employee-hours, used by the Bureau of Labor Statistics in reporting occupational injury and illness statistics developed from OSHA-required record keeping, and by industries and organizations following this system. Also known as "safety ratio."
Incombustible	Substance than cannot be burned; noncombustible.
Inert Gas	Gas that does not normally combine chemically with the base metal or filler metal.
Infection	State or condition in which the body or a part of it is invaded by a pathogenic agent that, under favorable conditions, multiplies and produces injurious effects.
Injury	Physical harm or damage to the body, as a result of violence, infection, or any other traumatic contact between the body and an outside agency or from exposure to environmental factors.
Inorganic	Term used to designate compounds derived from other than vegetable or animal matter; generally do not contain carbon.
Ion	Electrically charged atom.



Appendix A Glossary

Irritant	External substance that produces an active response in a living organism.
Jigs and Fixtures	Often used interchangeably: a jig holds work in position and guides the tools acting on the work; a fixture holds but does not guide.
Joule	Unit of energy used in describing a single pulsed output of a laser. It is equal to 1 watt/second or 0.239 calories.
Kelvin Scale	Fundamental temperature scale, in which the temperature measure is based on the average kinetic energy per molecule of perfect gas. The zero of the Kelvin scale is -273.18° Celsius.
Kinetic Energy	Energy possessed by a moving body, equal to one-half its mass multiplied by the square of its velocity.
Laminar Air Flow	Streamlined air flow in which the entire body of air within a designated space moves with approximate uniform velocity in one direction along parallel flow lines.
Laser	Acronym for "light amplification by stimulated emission of radiation." Light from a laser beam travels in only one direction and is all the same wavelength, so it reinforces itself.
Latent Period	Time that elapses between exposure and the first signs of damage.
LC₅₀	Lethal concentration that will kill 50 percent of the test animals within a specified time.
LD₅₀	Dose required to produce death in 50 percent of the exposed species within a specified time.
Lead Poisoning	Lead compounds can produce poisoning when they are ingested or inhaled. Inorganic lead compounds cause symptoms of lead colic and lead anemia. Organic lead compounds can attack the nervous system.
Lethal	Capable of causing death.
Liquid	State of matter in which the substance is a formless fluid that flows



Appendix A Glossary

in accord with the laws of gravity.

Local Exhaust Ventilation (LEV)

Ventilation system that captures and removes the contaminants at the point where they are being produced, before they escape into the workroom air.

Loudness

Intensive attribute of an auditory sensation, in terms of which sound may be ordered on a scale extending from soft to loud. Depends primarily on the sound pressure, but also on the frequency and wave form of the stimulus.

Lower Explosive Limit (LEL)

Lower limit of flammability of a gas or vapor at ordinary ambient temperatures, expressed in percentage of a gas or vapor. This limit is assumed constant for temperatures up to 120° C. Above this, it should be decreased by a factor of 0.7, because explosion ability increases with higher temperatures.

Lumen

Flux on 1 square foot of a sphere, 1 foot in radius, with a light source of one candle at the center that radiates uniformly in all directions.

Maintenance

Activities intended to ensure that facilities and equipment should be in good operating condition.

Makeup Air

Clean, tempered outdoor air supplied to a work space to replace air removed by exhaust ventilation or some industrial process.

Management Oversight and Risk Tree (MORT)

System safety concept calling for the application of analytic procedures to all phases of a safety program; its basic tool is the MORT chart, a "tree" identifying significant elements of a safety program.

Manometer

Instrument for measuring pressure of gases or vapors by changing the level of a fluid in a tube. It consists essentially of a U-tube partially filled with a liquid and constructed so that the amount of displacement of the liquid indicates the pressure being exerted on the instrument.

Mass

Quantity of matter. The units of measure are the gram and the pound.



Appendix A Glossary

Maximum Use Concentration (MUC) Product of the protection factor of the respiratory protection equipment and the permissible exposure limit (PEL).



Appendix A Glossary

Mist	Combination of two or more substances that may be separated by mechanical means. The components may not be uniformly dispersed.
Melting Point	Temperature at which a specified solid begins to liquify.
Metabolism	Flow of energy and the chemical and physical changes that are taking place in any living organism.
Mutagen	Any substance that causes changes in the genetic structure in a living cell and can be passed on to subsequent generations of the animal or human.
Necrosis	Destruction of body tissue.
NFPA (National Fire Protection Association)	A voluntary membership organization whose aim is to promote and improve fire protection and prevention.
NIOSH (National Institute for Occupational Safety and Health)	A Federal agency that conducts research on health and safety concerns, tests and certifies respirators, and trains occupational health and safety professionals.
Noise Level	Weighted sound pressure level (sound level), with the weighting network (e.g., A or C) indicated. Noise level is quantified by the logarithm of the ratio of the measured sound pressure level to a reference level.
Octave Band	Arbitrary spread of frequencies. The top frequency is always twice the number of the bottom one. The octave band may be referred to by a center frequency.
Oxygen Deficiency	Atmosphere having less than approximately 21 percent oxygen, normal air at sea level. More precisely, the deficiency occurs when the partial pressure of oxygen falls below 120 mm Hg.
Pathogen	Capable of producing disease.
Permissible Exposure Limit (PEL)	Exposure limit that is published and enforced by OSHA as a legal standard.



Appendix A Glossary



Appendix A Glossary

Personal Protective Equipment (PPE)	Devices worn by the worker to protect him or her against hazards in the environment.
Pitot Tube	Tube with a short right, angled bend, used with a manometer for measuring the velocity of fluids (liquid or gas) by means of pressure difference.
Pneumoconiosis	Disease of the lungs resulting from the inhalation of various kinds of dusts and other particles, e.g., asbestosis, siderosis, silicosis.
Pollution	Contamination of the environment with quantities of harmful substances or energies as to make air, water, and/or land unfit or less desirable.
Power	Time rate at which work is done; units are the watt (1 joule per second) and the horsepower (33,000 foot-pounds per minute).
ppm	Parts per million (as in parts of vapor or gas per million parts of air, by volume).
Protection Factor (PF)	With respiratory protection equipment: the ratio of the ambient airborne concentration of the contaminant to the concentration inside the facepiece.
Pyrometer	Instrument for measuring high temperature. For example, an optical pyrometer measures temperature by matching the light from heated materials with a standard source.
Radiant Temperature	Temperature resulting from the body is absorption of radiant energy.
Radiation	Emission and propagation of energy and/or particles in the form of waves through space or through a material medium.
Radioactivity	Disintegration of the nucleus of an atom.
Raynaud's Syndrome	Abnormal constriction of the blood vessels of the fingers on exposure to cold temperature.
Regulator	Mechanism for controlling or governing the movement of machinery, or the flow of liquids, gases, electricity, steam, etc.



Appendix A Glossary

Relative Humidity	Ratio of the quantity of water vapor present in air to the quantity that would saturate it at any specific temperature.
Risk	Measure of both the probability and the consequence of all hazards of an activity or condition.
Risk Assessment	Amount or degree of potential danger perceived by a given individual when determining a course of action to accomplish a specified task.
Respirator	Protective device to protect the wearer from inhaling contaminated air.
Route of Entry	Path by which chemicals can enter the body.
Safety	General term denoting an acceptable level of risk of, relative freedom from, and low probability of harm.
Safety Factor	Ratio, allowed for in design, between the ultimate breaking strength of a material, structure, or equipment and the actual working stress or safe permissible load placed on it during ordinary use. See "incident rate."
Sample	Subgroup of the population of cases or subjects under study, selected according to some rule or plan.
Sensitizer	Chemical that, after extended or repeated exposure, produces in some individuals an allergic type of skin or respiratory irritation.
Silicosis	Chronic lung disease, due to the inhalation of silica dust.
Short-Term Exposure Level (STEL)	Exposure limit recommended by the American Congress of Governmental Industrial Hygienists. Maximum concentration to which workers can be exposed for a short period of time (15 minutes) for only 4 times throughout the day, with at least 1 hour between exposures.
Smoke	Air suspension of particles less than 0.1 micron in size, resulting from the incomplete combustion of carbonaceous materials.



Appendix A Glossary



Appendix A Glossary

Sound	Oscillation in pressure, stress, particle displacement, particle velocity, etc., which is propagated in an elastic material, in a medium with internal forces or the superposition of such propagated oscillations.
Sound Level	Weighted sound pressure level, obtained by the use of metering characteristics and the weighting A, B, or C specified in ANSI S1.4.
Sound Level Meter	Instrument for use in measuring sound pressure levels in decibels referenced to 0.0002 microbars.
Stress	Physical, chemical, or emotional factors that cause bodily or mental tension and may be a factor in disease or fatigue.
Substitution	In relation to toxic or hazardous materials, the replacement of such materials (or the equipment or processes used with them) by ones that are less harmful.
System Safety	Approach to accident prevention that involves the detection of deficiencies in system components which have an accident potential.
Temperature, Dry Bulb	Temperature of a gas or mixture of gases indicated by an accurate thermometer after correction for radiation.
Temperature, Wet Bulb	Thermodynamic wet-bulb temperature is the temperature at which liquid or solid water, by evaporating into air, can bring the air to saturation at the same temperature and pressure.
Temporary Threshold Shift (TTS)	Hearing loss suffered as a result of exposure to noise, all or part of which is recovered during an arbitrary period of time after one is removed from the noise source.
Threshold Limit Value (TLV)	Time-weighted average concentration under which most people can work consistently for eight hours a day, day after day, with no harmful effect. Published annually by the American Congress of Governmental Industrial Hygienists.
Time-Weighted Average (TWA)	Refers to concentrations of airborne toxic materials that have been weighted for a certain time duration, usually eight hours.



Appendix A Glossary



Appendix A Glossary

Toxicity	Relative property of a chemical agent that refers to a harmful effect on some biological mechanism and the condition under which this effect occurs.
Trauma	Injury, wound, or shock brought about by an outside force.
Ultraviolet	Those wavelengths of the electromagnetic spectrum that are shorter than those of visible light and longer than Xrays.
Universal Precautions	Approach to infection control in which all human blood and certain body fluids are treated as if known to be infectious for HIV, hepatitis, and other bloodborne infections.
Upper Explosive Limit (UEL)	Maximum proportion of vapor or gas in air above which propagation of flame does not occur.
Vapor	The gaseous form of a substance that is normally in the solid or liquid state (at room temperature and pressure).
Vapor Density	Weight of a vapor per unit volume at any given temperature and pressure.
Vapor Pressure	Force exerted at any given temperature by a vapor, either by itself or in a mixture of gases; measured at the surface of an evaporating liquid.
Ventilation	One of the principal methods to control health hazards; may be defined as "causing fresh air to circulate to replace foul air simultaneously removed."
Vibration	Oscillation motion about an equilibrium position produced by a disturbing force.
Watt (w)	Unit of power, equal to 1 joule per second.
Wavelength	Distance in the line of advance of a wave from any point to a like point on the next wave; usually measured in angstroms, microns, micrometers, or nanometers.



Appendix A Glossary



Appendix A Glossary

Work Environment

Physical location, equipment, material processed or used, and the kinds of operations performed in the course of an employee's work, on or off the employer's premises.

Work Stress

Biomechanically, any external force acting on the body during the performance of a task.